Kaikorai Catchment Simulation Calculator

Report on development

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Contents

[Introduction 3](#_Toc246487818)

[Overview: 3](#_Toc246487819)

[Process 3](#_Toc246487820)

[Tough start 3](#_Toc246487821)

[The drive 3](#_Toc246487822)

[The Meetings 4](#_Toc246487823)

[The calculator 5](#_Toc246487824)

[Designing the calculator 5](#_Toc246487825)

[Making the Calculator 6](#_Toc246487826)

[Final Product 6](#_Toc246487827)

[Evaluation 7](#_Toc246487828)

# Introduction

Kaikorai Catchment Simulation Calculator or KCSC was built using Visual basic and Excel. It was made by the polytechnic students David, Lok, Wilson and it was mentored by Professor Samuel Mann and Hamish Smith.

# Overview

We built a simulation map where users can input data and watch the Catchment change and how it effects down stream. We had 4 input parameters Waste, Air Pollution, Stream restoration and recycling. Inputting numbers would change the colours of the Catchment from Green (Healthy) to more shades of Blue (Unhealthy) Or in the Loks version of the Catchment Light green (Healthy) to a Dark red (Unhealthy) shows how health the Catchment.

# Process

## Tough start

At the start of this project we got handed a letter by Hamish one of the polytechnic’s tutor. We thought of what we could do to fit the design specifications of this project. We decided to use flash action script 3 to get a quiz based structure and rubbish pickup games. We sent our project proposal on Saturday. We got a reply saying that we misinterpreted our design documentation and what they wanted out of our project. We were shocked but Sam suggested that we should go out for a drive out to the Catchment on Sunday, so that he can show and discuss what they wanted out of this project. We were really happy, to get some clarification on the project.

## The drive

As we drove out to the Kaikorai Catchment with photo cameras in hand we got to see the Kaikorai Catchment in all its glory. We went around certain areas around the Catchment where Sam talked about its history and saw many gardens and health risks relating to the stream and old areas. Back in the old days where they would just dump wastes into the stream causing the stream to be polluted for about 60 years. But it also showed that old buildings where trying to improve, in this day of age. We got to see the end of the Catchment the fresh water meats salty water, which water was polluted and how people are trying to help the environment using gardens and trees. It was all fun until the rain cut the field trip really short. Overall the drive really helped us in this project and how we modelled the Catchment.



Figure 1 Area of Kaikorai catchment



Figure 2 Green Island stream

## The Meetings

After the drive we had a meeting to go through how he wanted the Catchment calculator built. Sam drew on the white board estimation areas of the Catchment and put images on the map that were taken during the drive around Kaikorai Catchment. As we place images, we saw what Sam wanted out of the project and we could do some mock-ups. The layout of the map he drew we kept and tried to replicate it in our design.



Figure 3 Replicating the layout of the Kaikorai Catchment.

## The calculator

As we saw from the wireframe interface Sam wanted us to build a calculator and to build a prototype in excel to sort out the mechanics of it. So we group our ideas together and built a simple calculator with 2 4 columns and showed Sam. Sam wanted more columns to show more of a impact of the environment has good and bad and only 4 inputs. We extended it to 8 columns and picked 4 inputs of how users can change the data.

Once we were done we showed Sam and Sam decided to just map in it excel along as we can get a model of the Catchment showing change and the effects of the pollution around the stream.

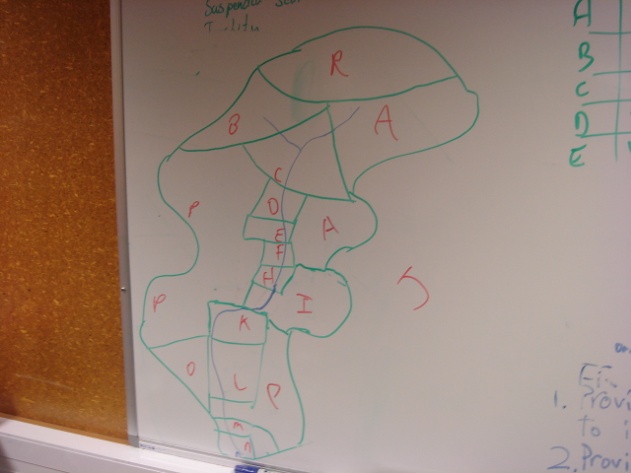


Figure 4 Planning for the Calculator

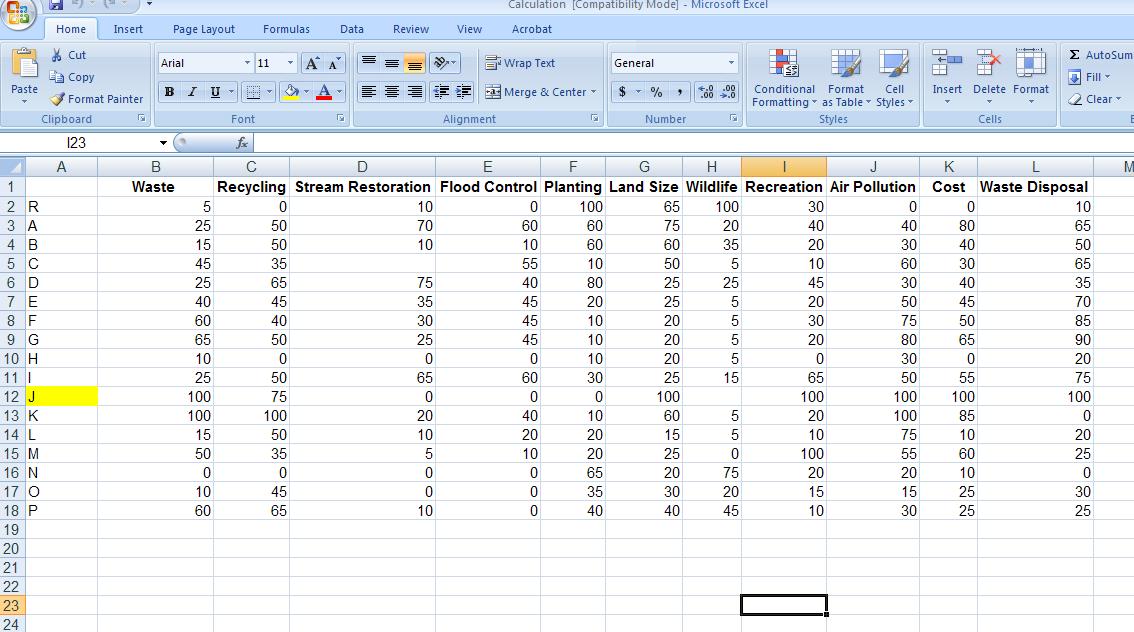


Figure 5 Spreadsheet detailing the Data for each area

## Designing the calculator

Once we got the go ahead from Sam we split our group effort where both Lok and Wilson would try and get it modelled in excel using visual basic and excel macros. David would go ahead and look for other applications which we could use in other applications. Lok was using a class based structure in his calculator so he didn’t have to use much code. Wilson was using a more write code for every calculation for his excel spreadsheet. David looked a Map Point and its effects after getting the technician to download map point he installed in his computer and found out the New Zealand map was not even close enough to be used for this calculator.

## Making the Calculator

To draw the map Wilson used the drawing tools on the excel spreadsheet to model the basic design that was made by the group with arrows showing and connecting the areas together. Once this was done the idea was modifying the values so the colours can change. Both Wilson and Lok had a different way of doing the calculators .Wilson did using a lot of visual basic script and Lok wanted to create a macro and much less code . We tried both ways so if we could get one working we would have a prototype.

# Final Product

In the end we used Lok and Wilson map, because it showed a simulation of the Catchment. The simulation of the project was a success as we success fully showed the Catchment adding or subtracting waste (and other variables) and connecting to other environments.



Figure 6 Loks Final Product



Figure 7 Wilsons Final Product.

# Evaluation

Overall we did a pretty good job; we work really hard getting this done early because of other commitments. We were made sure Sam was satisfied with our work before we continue on to the next step of our project.